

REVISION EXERCISES

Number System

- Write all the whole numbers between 3 and 73 by using the digits 7, 0 and 4, if repetition of digits is :
(a) allowed (b) not allowed
- Arrange all the digits of the number 540280 to get the smallest and the largest number of six digits.
- On dividing 5219 by a certain number, we get quotient = 68 and remainder = 51. Find the divisor.

Powers and Roots

- Evaluate :
(a) $(3 + 2)^3 + 4(2^3 \div 2^4 \times 2^2)$
(b) $(2^4 + 3^2) \div (5 \times 9^0)$
- Evaluate :
(a) $\sqrt[3]{25 + \sqrt[3]{8}}$ (b) $\sqrt{5 + \sqrt[3]{64}}$
- The volume of a cube is 1728 cm^3 . Find its side.

H.C.F. and L.C.M

- (a) Find the H.C.F. of 144, 384 and 648.
(b) Find the L.C.M of 240, 216 and 1260.
- Find the greatest number which can divide 77 and 123, leaving remainders 2 and 3 respectively.
- L.C.M. and H.C.F. of numbers x and 504 are 2520 and 126 respectively. Find the value of x .

Fractions

- Arrange the following fractions in ascending order :
(a) $\frac{5}{6}$, $\frac{17}{18}$ and $\frac{7}{9}$
(b) $\frac{17}{18}$, $\frac{11}{12}$ and $\frac{15}{16}$
- Evaluate :
(a) $\frac{5}{6}$ of $\frac{5}{13} \div \frac{15}{16} \times 1\frac{1}{2}$
(b) $5 - \left[1\frac{3}{5} - \left\{ 5\frac{1}{4} \div \left(4\frac{3}{4} + 3\frac{1}{8} \right) \right\} \right]$
- In a class, $\frac{1}{5}$ of it secured first division, $\frac{1}{10}$ of it secured second division and the remaining 70 students secured third division. Assuming that no student of the class had failed, find the total number of students in the class.

Decimal Fractions

- Evaluate :
(a) $3.0745 \div 13$ (b) $16.632 \div 0.12$

14. Evaluate :

- $6.4 + 6.4 \times 6.4 \div 6.4 - 6.4$
- $\frac{14.7 \times 2.2 \times 0.1}{1.1 \times 2.1} - \frac{4.01 \times 0.4}{0.02} + 95$

- The cost of 5 pens is ₹ 26.15 and the cost of 12 pencils is ₹ 23.40. Find the cost of 8 pens and 9 pencils.

Unitary Method

- With uniform speed of 12 km per hour, Meeta is able to reach school in 20 minutes. In order to reach school in 15 minutes, with what uniform speed must she go?
- Tap A can fill a tank in 4 hours and when the tank is full tap B can empty it in 6 hours. Find the time in which the empty tank will be filled, if both the taps are opened together.
- A and B can do a work in 20 days and 15 days respectively. Find :
(a) work done by B in 3 days
(b) work left after B has worked for 3 days.
(c) the number of days that A will take to complete the remaining work.

Speed, Distance and Time

- Rajesh runs 210 m in 24 seconds. Find :
(a) his speed.
(b) distance covered by him in 6 seconds.
(c) time taken to cover a distance of 2.8 km.
- A train, 120 m long, is running at the speed of 90 kmh^{-1} . How much time will it take to cross an electric pole?
- A railway platform is 240 m long. In how much time will a train of length 260 m and running with a speed of 75 kmh^{-1} , pass the platform?

Ratio and Proportion

- If $a : b = 3 : 2$ and $b : c = 4 : 5$, find:
(a) $a : b : c$ (b) $a : c$
- Divide ₹ 720 in the ratio $\frac{1}{3} : \frac{2}{3} : \frac{1}{2}$.
- Find the mean proportional between 75 and 243.

Percent and Percentages

- Out of 80 apples, 15% are rotten. How many are in good condition.
- The cost of an article increased from ₹ 3200 to ₹ 3520. Find the percentage increase.
- A school has 74% boys and 1079 girls. Find the strength of the school,

Profit, Loss and Discount

28. (a) The selling price of 8 articles is same as the cost price of 10 articles. Find the profit or loss as percent.
 (b) The selling price of 10 articles is same as the cost price of 8 articles. Find the profit or loss as percent.
29. Find the marked price of an article which is sold for ₹ 1,020 after giving a discount of 15%.
30. An article is marked at ₹ 137.50 and is sold for ₹ 121. Find :
 (a) the discount (b) the discount percent.

Simple Interest

31. At what rate percent of simple interest, will a sum of money double itself in 8 years?
32. In what time will an amount triple itself at the rate of 10% per annum?
33. A sum of ₹ 3,000 becomes ₹ 3,960 in two years at simple interest. Find :
 (a) the rate of interest
 (b) the amount, of ₹ 4,800 in 3 years at the same rate of interest.

Averages

34. The average of 90, 124, 146, x and 168 is 134. Find x .
35. (a) Find the average of first 10 prime numbers.
 (b) Find the average of first 12 even natural numbers.
36. The average of numbers 29, $x - 3$, 36, 39, x and $x - 8$ is 41. Find x .

Fundamental Concepts (Algebra)

37. Write the degree of :
 (a) $8 - 7x + 15xy + 9y^3$
 (b) $13x^3y^2 - 5xy^3 + 6xyz - 3z^2y^2$
38. Subtract :
 (a) $2 - 7x^2 + 7x$ from $4x^2 + 4x + 2$
 (b) $x^2 - 5x - 9$ from $9 + 5x - x^2$
39. (a) Multiply $2x - 5y + 6$ and $-3x + 2y - 7$
 (b) Divide $4x^3 - 16x^2 + 23x - 12$ by $2x - 3$.

Product

40. Evaluate :
 (a) $(x + 9)(x + 3)$ (b) $(x - 4)(x + 8)$
 (c) $(x + 7)(x - 5)$ (d) $(x - 3)(x - 1)$
41. Subtract $13x^2 + 7$ from the sum of $x^2 + 5x - 16$ and $-x^2 - 5x + 16$.
42. Evaluate :
 (a) $(x + y)(x^2 - xy + y^2)$
 (b) $(x^2 + x - 1)(x^2 + 4x - 5)$

Simplification

43. Simplify :

$$\frac{x^2 + 2}{3} + \frac{x - 2}{2} - \frac{3x^2 - 1}{6}$$
44. Simplify :

$$\frac{4x^2 - 12x + 9}{2(x + 2)} \div \frac{12x^2 - 36x + 27}{3x^2 + 6x}$$
45. Simplify :

$$\frac{x^2 - y^2}{5} \times \frac{4x}{x + y} \div \frac{x - y}{5}$$

Equations and Inequations

46. Solve :
 (a) $5(3x - 1) + 2 = 12x + 6$
 (b) $\frac{x}{3} + \frac{x + 1}{2} = 3$
47. Solve :
 (a) $3(2 - 5x) + 24x = 12$
 (b) $\frac{x}{2} - 1 = \frac{2}{3}x - 3$
48. Use $3x + 5 \leq 17$ to find the value of x if :
 (a) $x \in \mathbb{N}$ (b) $x \in \mathbb{W}$

Formula

49. Given : $A = \frac{5}{2}(b - 20)$
 Make 'b' as the subject of the formula.
50. Given : $\frac{1}{f} = \frac{1}{u} + \frac{1}{v}$
 (a) Make 'u' the subject of formula
 (b) Find 'u', if $f = 12$ and $v = 3$
51. Given : $2x + 5y = 4 - 4x + 6y$
 (a) Make 'y' the subject of formula.
 (b) Find y when $x = 2$.

Problems Based on Simple Equations

52. The length of a rectangle is 4 times of its breadth. If perimeter of the rectangle is 60 m; find its length and breadth.
53. Geet's age is 5 years and his mother's age is 32 years. After x years, mother's age will be four times that of her son. Find the value of x .
54. One-fourth of a number exceeds one-fifth of its succeeding number by 5. Find the number.

Factorisation

55. Factorise :
 (a) $a^2b^2 - c^2$
 (b) $25(x + y)^2 - 9(x - y)^2$
 (c) $4(bc - a)^2 - 9a^2$
56. Factorise :
 (a) $2a - 4a^2 + 5b - 10ab$
 (b) $2x^2 - 5xy - 2xy + 5y^2$

57. Evaluate :

(a) $\left(15\frac{1}{4}\right)^2 - \left(14\frac{3}{4}\right)^2$

(b) $(21.8)^2 - (18.2)^2$

Graph

58. Draw the graph of equation $y = 5x + 3$

59. Which of the following points lie on :

(a) x-axis (b) y-axis

$(5, 0), (-8, 0), (4, 2), (0, 7), (-5, -3), (0, -2), (0, 0),$ and $(-8, -6)$.

60. Draw the graph of equation $x + y = 0$. Does it pass through origin?

Relations and Mappings

61. If $(3a + 4b, -7) = (a + 2, b - 5)$; find the values of a and b .

62. Given ordered pairs:

$(3, 2), (3, 4), (6, 5), (7, 9), (4, 4), (4, 6), (7, 7), (3, 9), (5, 9), (4, 7),$ and $(5, 2)$.

Find the relations R_1, R_2 and R_3 such that :

$R_1 =$ 'is less than'

$R_2 =$ 'is equal to'

$R_3 =$ 'is greater than'.

63. Let $A = \{4, 5, 6, 7\}$ and $B = \{a, b, c, d, e\}$.

State, giving two reasons, why :

$\{(4, a), (5, c), (7, d), (5, e)\}$ is not a mapping from set A to set B .

Indices

64. Evaluate :

(a) $3x^2y^3 \times (-5xy^4)^3$

(b) $(2x^3)^2 \times (3x^2)^3$

(c) $(6^{-2} \times 6^4) \div (3^4 \div 3^3)$

65. Express in terms of 2 and 3 :

$$\frac{2^{12} \times 3^{-11} \times 4^5}{2^8 \times 3^{-14} \times 2^5}$$

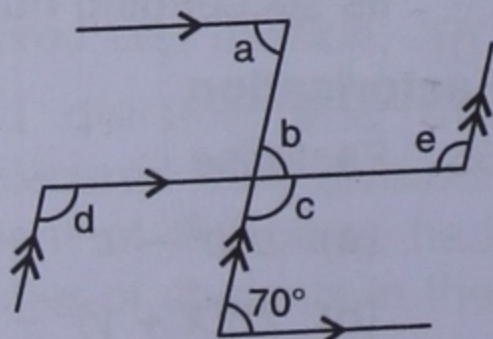
66. Find x , if:

(a) $32^x = 8$ (b) $5^{x-3} = \frac{1}{25}$

Lines and Angles

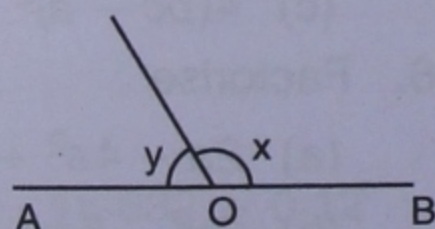
67. Find the supplement and complement angles of angle $63^\circ 32' 20''$

68. Find the lettered angles.



69. In the given figure, AOB is a straight line

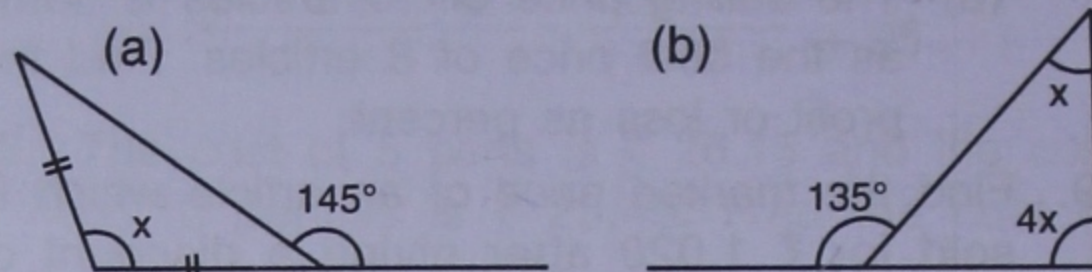
(a) Find x and y , if $x - y = 60^\circ$



(b) Find x and y , if $x : y = 5 : 4$

Triangles

70. Find the value of x in each of the following cases:



71. The angles of a triangle are in the ratio $5 : 3 : 8$. Show that the triangle is a right angled triangle.

72. The ratio between a base angle and the vertex angle of an isosceles triangle is $3 : 4$. Find its angles.

Symmetry

73. Draw a rough sketch of a rectangle ABCD. Now draw, if possible, its lines of symmetry.

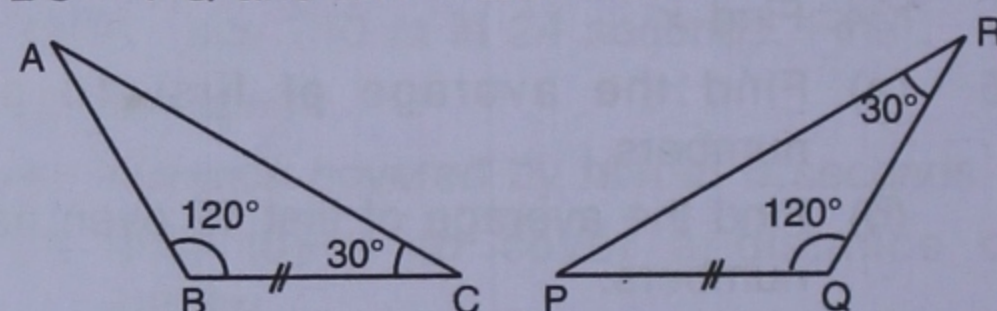
74. Draw a rough sketch of an equilateral triangle ABC. Draw all its lines of symmetry.

75. Draw all possible lines of symmetry for each of the following letters :

D H I M O T and V

Congruency

76. In the following figure, $\angle B = \angle Q = 120^\circ$, $BC = PQ$ and $\angle R = \angle C = 30^\circ$

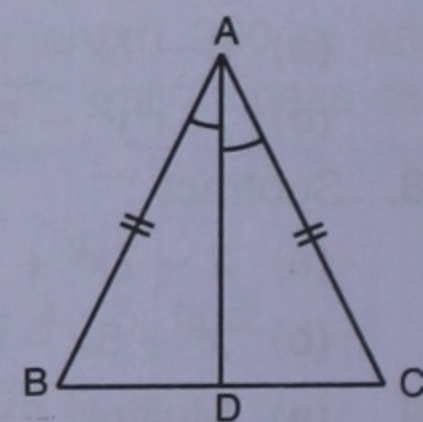


(a) Show that $\triangle ABC \cong \triangle PQR$

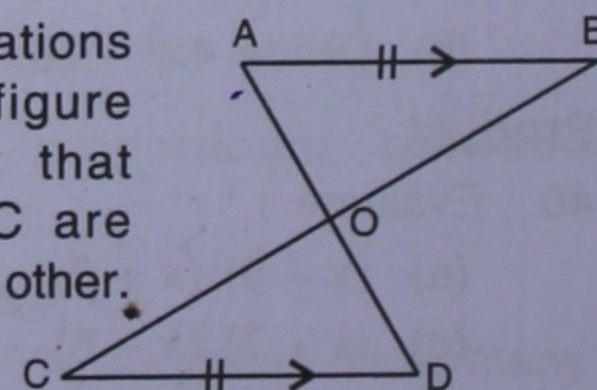
(b) If the triangles are congruent, write their corresponding sides and corresponding angles.

77. The given figure shows a triangle ABC in which $AB = BC$ and AD bisects angle BAC.

Is $\triangle ABD$ congruent to triangle ACD ? Which axiom is satisfied?



78. Using the informations given in the figure alongside, show that $\triangle OAB$ and $\triangle ODC$ are congruent to each other.



Polygon

79. Find the number of sides of a polygon if each interior angle of it is 135° .

80. Four angles of a quadrilateral are respectively $(x + 10)^\circ, (2x + 50)^\circ, (6x - 30)^\circ$ and $(x - 15)^\circ$. Find the value of x .

81. Two angles of a quadrilateral are 89° and 141° . If the other two angles are in the ratio 3 : 7, find these angles.

Construction of Quadrilaterals

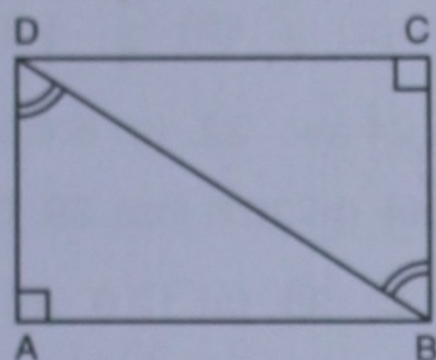
82. Construct a rectangle with one side 6 cm and diagonal 9 cm.
 83. Construct a parallelogram with two adjacent sides 4 cm and 5 cm and one diagonal 7 cm.
 84. Construct a square with diagonal 7.2 cm.

Introduction of Theorems

85. In an isosceles triangle, prove that the angles opposite to equal sides are equal.

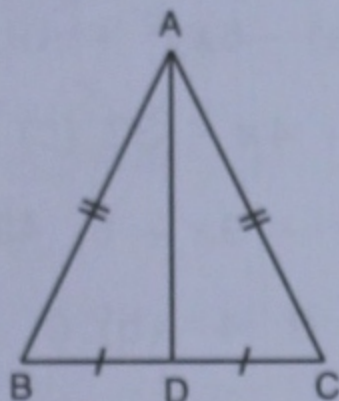
86. Use the given informations to show :

- (a) $\triangle ABD$ and $\triangle CDB$ are congruent.
 (b) $AB = DC$.



87. In the given figure $AB = AC$ and D is the mid point of BC.

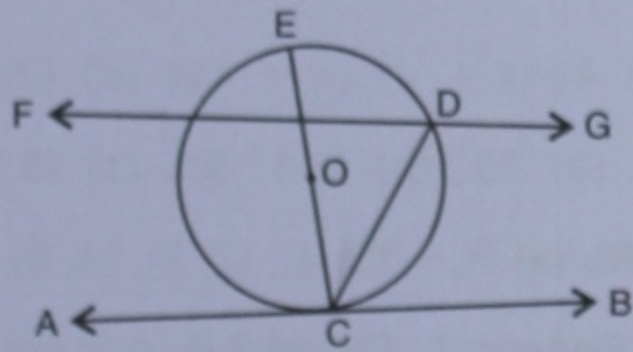
Show that triangles ABD and ACD are congruent.



Circles

88. Write the geometrical name of each of the following :

- (a) OC
 (b) CE
 (c) CD
 (d) FG
 (e) AB



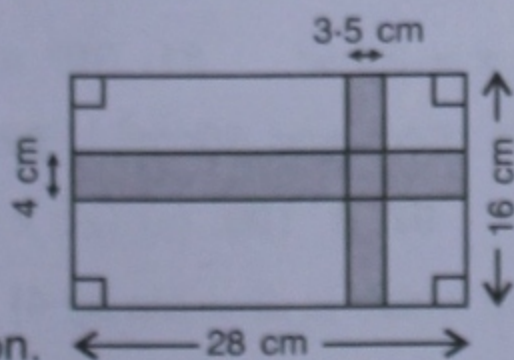
89. Draw a circle with radius 5cm. In this circle, draw and shade a major segment.
 90. Draw a circle with radius 4cm. In this circle, draw and shade a major sector.

Perimeter and Area

91. The perimeter of a rectangle is 32 cm and its length is 10 cm. Find its breadth and area.
 92. The perimeter of a square is 28 cm. Find its area.

93. Use the given informations to find the area of :

- (a) shaded portion.
 (b) unshaded portion.



Volume and Surface Area

94. Find the area of the card board required to make an open box 2.5 m long, 1.5 m wide and 2 m high.
 95. The area of four walls of a tank 10 m long and 4 m high is 120 m^2 . Find its width.

96. Find the volume of a cube, if its total surface area is 96 cm^2 .

Collection and Tabulation of Data

97. Arrange the following data as an array in ascending order.

8.8, 8.6, 8.6, 8.3, 8.2, 8.7, 8.5, 8.4, 8.7 and 8.7.

Write the frequency of 8.7.

98. For the following table, draw;

- (a) a bar graph. (b) a pie Chart.

Items	A	B	C	D	E
Frequency	75	80	100	50	55

99. Draw a histogram for the following table :

Class-interval	10-20	20-30	30-40	40-50	50-60	60-70
Frequency	12	8	18	10	16	4

Set Concepts

100. Write the following sets in set builder notation:

- (a) set of letters of the word "FOLLOWINGS".
 (b) set of $-12, -8, -4, 0, 4, 8, 12, 16$ and 20 .
 (c) $\left\{ \frac{1}{2}, \frac{1}{3}, \frac{1}{5}, \frac{1}{7}, \frac{1}{11} \right\}$

101. Let $A = \{x : x = 2n \text{ and } n \leq 6\}$. Express A in roster form, if.

- (a) n is a natural number.
 (b) $n \in W$

102. Let A be the set of all the letters of the word 'ALLAHABAD'. Express set A in :

- (a) Description method.
 (b) Tabular form.
 (c) Set-builder form.

Set and Universal Set

103. Given set $A = \{5, 8, 15\}$. Write all its:
 (a) sub-sets (b) proper sub-set
 104. If $n(A) = 24, n(B) = 15$ and $n(A \cup B) = 35$; find : $n(A \cap B)$.

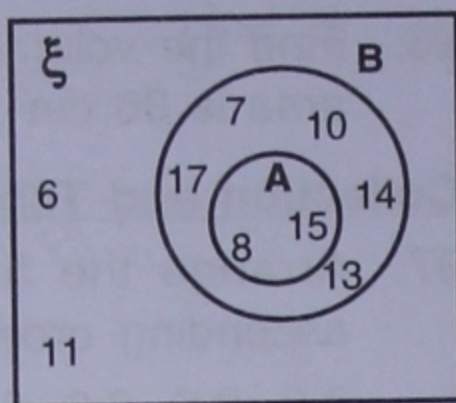
105. If universal set is the set of natural numbers;

Set $A = \{x : 10 \leq x \leq 15\}$ and
 Set $B = \{x : 13 < x \leq 20\}$
 Show that $(A \cup B)' = A' \cap B'$

Venn-Diagram

106. Use venn-diagram to show, for two overlapping sets A and B, the sets $A - B$ and $B - A$ are disjoint.

107. Using the given venn-diagram, write the following sets :
- (a) Universal set ξ
- (b) $A \cap B$
- (c) $A \cup B$

(d) B' (e) A'

108. If $n(A) = 64$, $n(B) = 54$ and $n(A \cap B) = 18$; use venn diagram to find the value of $n(A \cup B)$.

ANSWERS

1. (a) 4, 7, 40, 47 and 70 (b) 4, 7, 40, 44, 47 and 70 2. Smallest = 200458; largest 854200 3. 76 4. (a) 133
 (b) 5 5. (a) 3 (b) 3 6. 12cm 7. (a) 24 (b) 15120 8. 15 9. 630 10. (a) $\frac{7}{9} < \frac{5}{6} < \frac{17}{18}$
 (b) $\frac{11}{12} < \frac{15}{16} < \frac{17}{18}$ 11. (a) $\frac{20}{39}$ (b) $4\frac{1}{15}$ 12. 100 13. (a) 0.2365 (b) 138.6 14. (a) 6.4 (b) 16.2
 15. ₹ 59.39 16. 16 km per hour 17. 12 hours 18. (a) $\frac{1}{5}$ (b) $\frac{4}{5}$ (c) 16 days 19. (a) 8.75 ms^{-1}
 (b) 52.5 m (c) 320 sec = 5 min. 20 sec 20. 4.8 sec 21. 24 sec 22. (a) 6:4:5 (b) 6:5 23. ₹ 160, ₹ 320 and
 ₹ 240 24. 135 25. 68 26. 10% 27. 4150 28. (a) 25% profit (b) 20% loss 29. ₹ 1,200 30. (a) ₹ 16.50 (b) 12%
 31. 12.5% 32. 20 years 33. (a) 16% (b) ₹ 7,104 34. 142 35. (a) 12.9 (b) 13 36. $x = 51$ 37. (a) 3 (b) 5
 38. (a) $11x^2 - 3x$ (b) $18 + 10x - 2x^2$ 39. (a) $-6xy^2 + 19xy - 32x - 10y^2 + 47y - 42$
 (b) $2x^2 - 5x + 4$ 40. (a) $x^2 + 12x + 27$ (b) $x^2 + 4x - 32$ (c) $x^2 + 2x - 35$ (d) $x^2 - 4x + 3$
 41. $-13x^2 - 7$ 42. (a) $x^3 + y^3$ (b) $x^4 + 5x^3 - 2x^2 - 9x + 5$ 43. $\frac{-x^2 + 3x - 1}{6}$ 44. $\frac{x}{2}$ 45. $4x$
 46. (a) 3 (b) 3 47. (a) $\frac{2}{3}$ (b) 12 48. 1, 2, 3, 4 (b) 0, 1, 2, 3, 4 49. $b = \frac{2A + 100}{5}$
 50. (a) $u = \frac{fv}{v-f}$ (b) $u = -4$ 51. (a) $y = 6x - 4$ (b) 8 52. Length = 24m and breadth = 6m
 53. $x = 4$ 54. 104 55. (a) $(ab + c)(ab - c)$ (b) $4(4x + y)(x + 4y)$ (c) $(2bc + a)(2bc - 5a)$
 56. (a) $(1 - 2a)(2a + 5b)$ (b) $(x - y)(2x - 5y)$ 57. (a) 15 (b) 144 59. (a) (5,0), (-8,0) and (0,0)
 (b) (0,7), (0,-2), and (0,0) 60. Yes 61. $a = 5$ and $b = -2$ 62. (a) $R_1 = \{(3, 4), (7, 9), (4, 6), (3, 9), (5, 9), (4, 7)\}$
 (b) $R_2 = \{(4, 4), (7, 7)\}$ (c) $R_3 = \{(3, 2), (6, 5), (5, 2)\}$ 63. Reason 1 : Element $6 \in A$ is not associated with any
 element in set B. Reason 2 : Element 5 of set A is associated with two elements c and e of set B
 64. (a) $-375x^5y^{15}$ (b) $108x^{12}$ (c) 12 65. $2^9 \times 3^3$ 66. (a) $\frac{3}{5}$ (b) 1 67. $116^\circ 27' 40''$ and $26^\circ 27' 20''$
 68. $a = b = 70^\circ$ and $c = d = e = 110^\circ$ 69. (a) $x = 120^\circ$ and $y = 60^\circ$ (b) $x = 100^\circ$ and $y = 80^\circ$
 70. (a) 110° (b) 27° 72. $54^\circ, 72^\circ$ and 54° 75. 76. (a) Yes, triangles
 are congruent by ASA. (b) Corresponding parts are : $PQ = CB$, $QR = BA$, $RP = AC$, $\angle P = \angle C$, $\angle Q = \angle B$
 and $\angle R = \angle A$ 77. Yes. By SAS 79. 8 80. $x = 34.5^\circ$ 81. 39° and 91° 88. (a) Radius
 (b) Diameter (c) Chord (d) Secant (e) Tangent 91. 6cm and 60cm^2 92. 49cm^2 93. (a) 154cm^2
 (b) 294cm^2 94. 19.75m^2 95. width = 5m 96. 64cm^3 97. 3 100. (a) $\{x : x \text{ is a letter used in the word}$
 "FOLLOWINGS"} (b) $\{x : x \text{ is an integer from } -12 \text{ to } 20 \text{ which is divisible by } 4\}$ (c) $\{x : x = \frac{1}{p}, \text{ where } p$
 is a prime number $\leq 11\}$ 101. (a) $\{2, 4, 6, 8, 10, 12\}$ (b) $\{0, 2, 4, 6, 8, 10, 12\}$ 102. Set of letters used in
 the word 'ALLAHABAD' (b) $\{a, l, h, b, d\}$ (c) $\{x : x \text{ is a letter of the word ALLAHABAD}\}$ 103. (a) $\phi, \{5\},$
 $\{8\}, \{15\}$ $\{5, 8\}$ $\{5, 15\}$ $\{8, 15\}$ and $\{5, 8, 15\}$ (b) $\phi, \{5\}, \{8\}, \{15\}, \{5, 8\}, \{5, 15\}$ and $\{8, 15\}$ 104. 4
 107. (a) $\{6, 7, 8, 10, 11, 13, 14, 15, 17\}$ (b) $\{8, 15\}$ (c) $\{7, 8, 10, 13, 14, 15, 17\}$ (d) $\{6, 11\}$
 (e) $\{6, 7, 10, 11, 13, 14, 17\}$ 108. 100